



US009636859B2

(12) **United States Patent**  
**Schad et al.**

(10) **Patent No.:** **US 9,636,859 B2**  
(45) **Date of Patent:** **May 2, 2017**

(54) **LOCK MEMBER FOR AN INJECTION  
MOLDING MACHINE**

(71) Applicant: **Athena Automation Ltd.**, Vaughan  
(CA)

(72) Inventors: **Robert D. Schad**, Toronto (CA);  
**Carsten Link**, Burlington (CA)

(73) Assignee: **ATHENA AUTOMATION LTD.**,  
Vaughan (CA)

(\*) Notice: Subject to any disclaimer, the term of this  
patent is extended or adjusted under 35  
U.S.C. 154(b) by 75 days.

(21) Appl. No.: **14/719,703**

(22) Filed: **May 22, 2015**

(65) **Prior Publication Data**

US 2015/0290856 A1 Oct. 15, 2015

**Related U.S. Application Data**

(62) Division of application No. 14/277,114, filed on May  
14, 2014, now Pat. No. 9,067,355.

(60) Provisional application No. 61/823,176, filed on May  
14, 2013, provisional application No. 61/877,484,  
filed on Sep. 13, 2013.

(51) **Int. Cl.**

**B29C 45/17** (2006.01)

**B29C 45/66** (2006.01)

**B29C 45/67** (2006.01)

**B29C 45/68** (2006.01)

**B29L 31/00** (2006.01)

(52) **U.S. Cl.**

CPC ..... **B29C 45/66** (2013.01); **B29C 45/1747**  
(2013.01); **B29C 45/6728** (2013.01); **B29C**  
**2045/688** (2013.01); **B29L 2031/757** (2013.01)

(58) **Field of Classification Search**

CPC ..... B29C 45/1747; B29C 45/6707; B29C  
45/6728; B29C 2045/688

See application file for complete search history.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

3,729,283	A	4/1973	Eggenberger
4,340,346	A	7/1982	Hehl
4,874,309	A	10/1989	Kushibe et al.
5,066,217	A	11/1991	Fukuzawa et al.

(Continued)

**FOREIGN PATENT DOCUMENTS**

AT	412625	5/2002
AT	13625 U	5/2014

(Continued)

*Primary Examiner* — James Mackey

(74) *Attorney, Agent, or Firm* — Bereskin & Par  
LLP/S.E.N.C.R.L., S.R.L.

(57)

**ABSTRACT**

A lock assembly for releasably coupling a platen to a tie bar of an injection molding machine includes first and second lock nut segments translatable in a transverse between locked and unlocked positions for respectively engaging and disengaging the tie bar, and a carrier assembly for coupling the lock nut segments to the platen. The carrier assembly provides a slide surface for slidably supporting the lock nut segments during the translation of the lock nut segments between the locked and unlocked positions, and the carrier assembly resiliently supports the slide surface for axial movement of the slide surface with the lock nut segments between an unloaded position in which the lock nut segments are spaced away from the platen by a clearance gap, and a loaded position in which the lock nut segments bear against the platen.

**14 Claims, 14 Drawing Sheets**

